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Male Marmosets Display Increased Sociosexual Behavior Toward Their Mate After Separation

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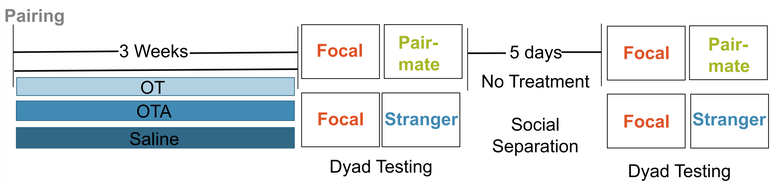
Introduction

- Oxytocin (OT) as the "Great Facilitator of Life" [1]
- OT is involved in the development of pair bonds between prairie vole mates [2]
- In Marmosets, OT:
  - Decreases fidelity-threatening behaviors [3,4]
  - Chronic OT plays a role in pair bond formation
    - OT increases food sharing and proximity between mates [5]
- Together this suggests that OT manipulation can somehow change the "quality" of a relationship

Hypotheses

1. If oxytocin plays a role in enhancing the development of a pair bond, then marmosets treated with oxytocin are expected to show higher social interest in their mate.
2. If marmosets are a social species that form bonds between mates, then marmosets should respond with high levels of affiliation after a separation from their mate.

Methods



- N = 6 marmoset monkeys
- Within subject design
- OT/OTA/Sal were counterbalanced and administered intranasally
- Behavioral measures:
  - Dyad observations both before and after 5 day separation

OT Manipulation Did Not Alter Marmoset Behavior in the Dyad Test

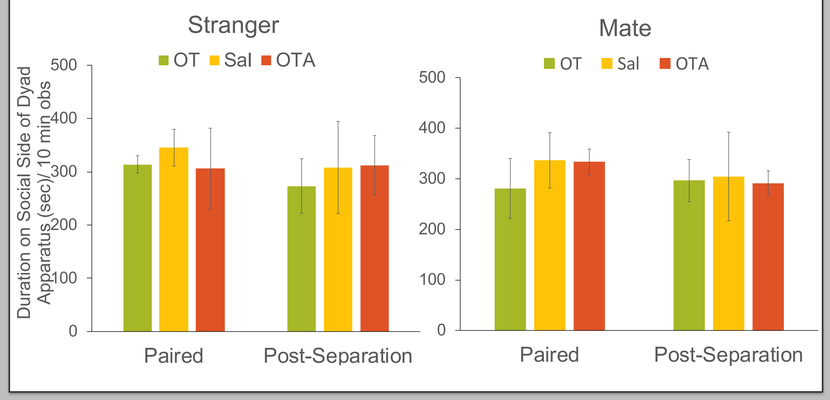


Figure 1. Oxytocin manipulation did not alter how much time marmosets spent on the "social" half of the testing apparatus during dyad testing. There was no oxytocin effect for behavior directed toward either the subject's mate or toward a stranger.

Male and Female Marmosets Showed Similar Patterns of Social Interest

Figure 2. Male and female marmosets did not differ in how much time they spent on the "social" side of the dyad testing apparatus and there was no difference in how much time they spent near either their mate or a stranger.

Male and Female Marmosets Displayed Different Patterns of Sexual Solicitations

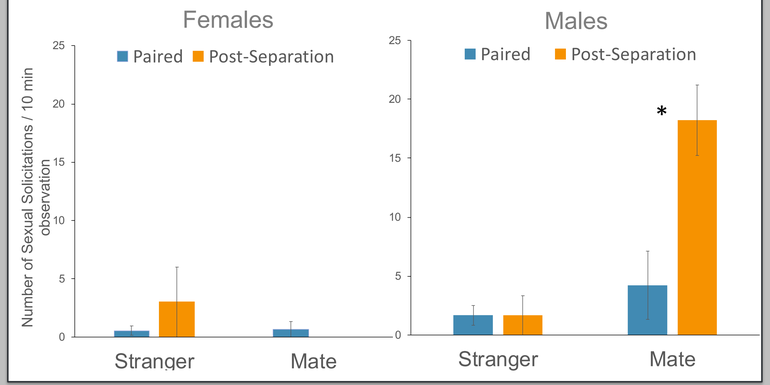


Figure 3. Left: Female marmosets showed no change in sexual solicitations toward a stimulus animal between dyad tests. Right: Male marmosets displayed similar numbers of sexual solicitations toward the stranger during the initial dyad test and after social separation. Male marmosets sexually solicited their mates more in the dyad test after social separation compared to during the initial dyad test.
* denotes $p < 0.05$

Conclusion

- OT manipulation does not alter patterns of social behavior in this context
- Male and female marmosets respond differently to social separation
- After social separation male marmosets display increased sexual solicitations, however, this effect is specific to their mate. This behavioral response pattern that is unique toward their mate may underlie the maintenance of social bonds, and broadly social monogamy.

References

1. Cavanaugh, J., Mustoe, A. C., Taylor, J. H., & French, J. A. (2014). Oxytocin facilitates fidelity in well-established marmoset pairs by reducing sociosexual behavior toward opposite-sex strangers. *Psychoneuroendocrinology, 49*1-10. doi: 10.1016/j.psyneuen.2014.06.020
2. Lee, H. J., Macbeth, A. H., Pagani, J. H., & Young, W. S. (2009). Oxytocin: The great facilitator of life. *Progress in Neurobiology, 88*(2), 127-151. doi: 10.1016/j.pneurobio.2009.04.001
3. Mustoe, A. C., Cavanaugh, J., Harnisch, A. M., Thompson, B. E., & French, J. A. (2015). Do marmosets care to share? Oxytocin treatment reduces prosocial behavior toward strangers. *Hormones & Behavior, 71*, 83–90. doi: 10.1016/j.yhbeh.2015.04.015
4. Smith, A. S., Agmo, A., Birnie, A. K., & French, J. A. (2010). Manipulation of the oxytocin system alters social behavior and attraction in pair-bonding primates, Callithrix penicillata. *Hormones & Behavior, 57*(2), 255-262. doi: 10.1016/j.yhbeh.2009.12.004
5. Williams, J. R., Insel, T. R., Harbaugh, C. R., & Carter, S. C. (1994). Oxytocin administered centrally facilitates formation of a partern preference in female prairie voles (Microtus ochrogaster). *Journal of Neuroendocrinology banner, 6*(3), 247-250. doi: 10.1111/j.1365-2826.1994.tb00579.x

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